**Java programming**

**Exercise 1 of 16**

**Instructions:**

All programs should be written, and linked to an online repository like GitHub.

A video to get you started with GitHub has been posted on Moodle.

After completing your assignment, post the link on the link on Moodle. An instructor will follow the posted link to access and grade your work.

Note that: Your program should always be well-commented. At the top of your assignment file, you should write a short description of what your program does and add other comments to help in explaining your code.

All of your variables should be given a deceptive name. Avoid giving your variables names like a, b, I, x, y etc.

In case you copy your friend's work, you both get a Zero (0).

**Section 1:**

1. Explain the differences between primitive and reference data types.

Primitive type always has a value,it can never be null but reference type can be null, which denotes the absence of value.

1. Define the scope of a variable (hint: local and global variable)

Scope of a variable is the place in your program where it can be referenced.

1. Why is initialization of variables required.

Because if this is not done,then previous values could be read,which was not safe.

1. Differentiate between static, instance and local variables.

Instances variables are created when an object is created with the use of the keyword’new’ and destroyed when the object is destroyed while static variables are created when the program starts and destroyed when the program starts while instance variables can be accessed directly by calling the variable name inside the class.

1. Differentiate between widening and narrowing casting in java.

Widening conversions preserve the source value but can change its representation while a narrowing conversion changes a value to a data type that might not be able to hold some of the possible values’

1. the following table shows data type, its size, default value and the range. Filling in the missing values.

|  |  |  |  |
| --- | --- | --- | --- |
| **TYPE** | **SIZE (IN BYTES)** | **DEFAULT** | **RANGE** |
| boolean | 1 bit | 0 | true, false |
| Char | 2 | 0 | ‘\0000’ to ‘\ffff’ |
| Byte | 1 | 0 | -128 to 127 |
| Short | 2 | 0 | -215 to +215-1 |
| Int | 4 | 0L | -2.1 to 2.1 |
| Long | 8 | 0L | - 9.2 to 9.2 |
| Float | 4 | 00.0f | 3.4 to 1.4E-324 |
| Double | 8 | 00.0f | -1.8E+308 to +1.8E+308 |

1. Define package as used in java programming

A package in java is used to group related classes

1. Explain the importance of using Java packages

To avoid name conflicts, and to write a better maintainable code.

Section 2:

1. Write a Java program that asks the user to enter their sur name and current age then print the number of characters of their sir name and even or odd depending on their age number.

Example of Expected result:

If sir name is Saruni and age is 29, output will be;

then the number of characters is 6.

Your current age is an odd number

Ans

Import java.util.Scanner;

Public class Main{public static void main(String[] args)}

Scanner scanner = new Scanner(System.in);

System.out.print(“Enter your surname:”);

String surname = scanner.nextLine();

System.out.print(“Enter your age:”);

Int age = scanner.nextlnt();

Int surnameLength = surname.length();

String ageType = (age % 2 == 0) ? “even”: “odd”;

System.out.println(“Your current age is an” + ageType + “number.”);

}

}

```

1. Write Java program to ask student to enter the marks of the five units they did last semester, compute the average and display it on the screen. (Average should be given in two decimal places).

Ans

Import java.util.scanner;

Public class average marks{

Public static void main(string[]args)

}

Scanner input=new

Scanner(system.in);

Double total marks=0;

System.out.println(“enter marks for five units”);

For(int i=1;<=5;i++{

System.out.print(“unit”+i+”:”

Doubleunit marks= input.nextdouble();

Totalmarks+=unit marks;

}

Double average marks=totalmarks/5;

System.out.printf(“average marks:%.2gf “averagemarks);

1. Write a program that will help kids learn divisibly test of numbers of integers. The program should check whether the given integer is divisible by integers in the range of 0-9. For example, if a number (955) is divisible by five, the program should print, the number is divisible by 5 because it ends with a 5, and 900 is divisible by 5 because it ends with a 0(zero).

Ans

Import java.util.scanner;

Public class divisible by integers

Public static void main(string[]args)

}

Scanner input=new

Scanner(system.in);

Num=int(input(“enter a number:”))

For i in range(10):

If num%i ==0:

If i ==0:

Print(“the number is divisible by 10because it ends with a 0”)

Else:

if num%10==5:

print(“the number is divisible by 5 because it ends with a 5”)

else:

print(“the number is divisible by”,i)

1. Write a Java program to display all the multiples of 2, 3 and 7 within the range 71 to 150.

Ans

Import java.util.scanner;

Public class multiples{

Public static void main(string[]args)

}

Int start = 71;

Int end = 150;

Int multiple2,multiple3,multiple7;

For(int i =start; i <=end; i ++) {

Multiple2= i %2;

Multiple3= i %3;

Multiple7=i %7;

If((multiple2==0)&&(multiple3==0&&(multiple==0)) {

}

}

}

1. Create a calculator using java to help user perform the basic operations (+, -, \* and /).
   1. User should be asked to enter a number, then an operation, the program computes the operation and display the output to the computer screen.

Ans

import java.util.Scanner;

public class Calculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the first number: ");

double num1 = scanner.nextDouble();

System.out.print("Enter the operation (+, -, \*, /): ");

char operator = scanner.next().charAt(0);

System.out.print("Enter the second number: ");

double num2 = scanner.nextDouble();

double result = 0.0;

switch (operator) {

case '+':

result = num1 + num2;

break;

case '-':

result = num1 - num2;

break;

case '\*':

result = num1 \* num2;

break;

case '/':

result = num1 / num2;

break;

default:

System.out.println("Invalid operation!");

return;

}

System.out.println("Result: " + result);

}

}